

Learning from Past Experiences in Ukraine

Jeff Schwoebel
Resource Enterprises, Inc.

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International Emerging Markets for
Coal Mine Methane Projects

Resource Enterprises

- 1982 –REI developed first commercial CMM project in the US
- 1982 – Initiated \$25 mm GRI contract for CBM research
- Late 1980's–present – Provide directional drilling and methane drainage services to numerous clients domestic and world wide



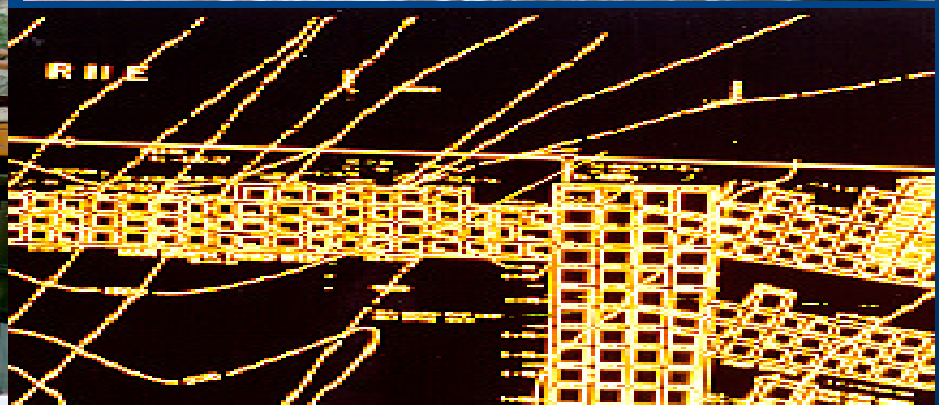
REI has provided methane drainage services around the world.



6/8/2001

International Emerging Markets for
Coal Mine Methane Projects

*REI has also
provided worldwide in-
mine directional drilling
services and training*



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International Emerging Markets for
Coal Mine Methane Projects

REI Experience in Ukraine

- IFREE
- US/AID
- World Bank
- EcoLinks

Why Ukraine?

Gas Market

- Consumes 75 BCM
- Produces 18 BCM

Why Ukraine?

CBM Resource

- Estimated at 117 TCM
- Donetsk Basin

330 coal seams

200 < 0.45 m

130 > 0.45 m

Why Ukraine?

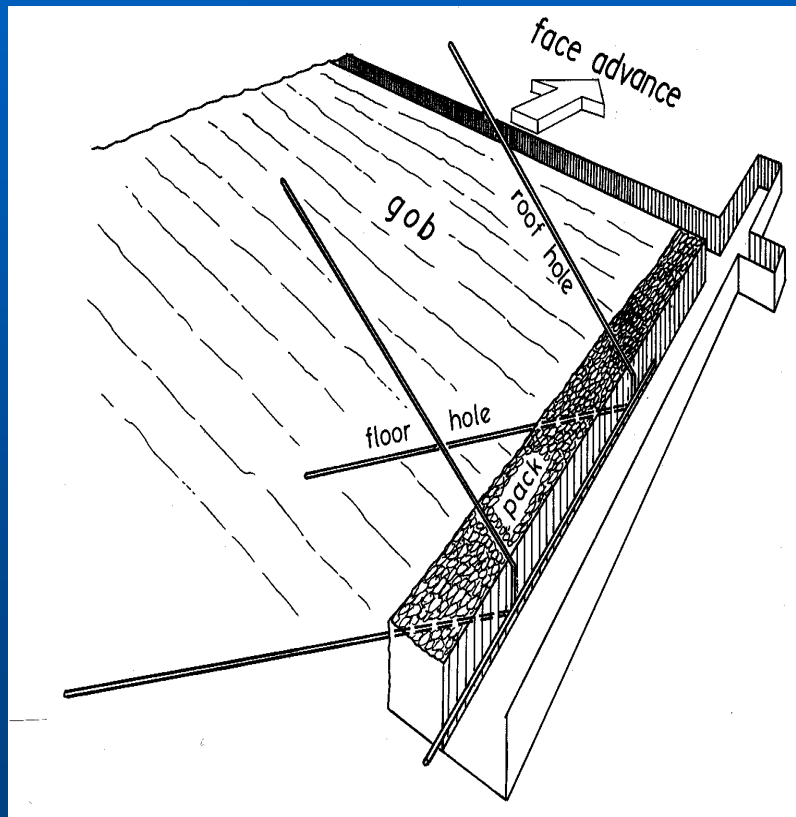
CMM Resource

- **Liberates 2 BCM**
- **13% extracted through degas system**
- **4% utilized**

Why Ukraine?

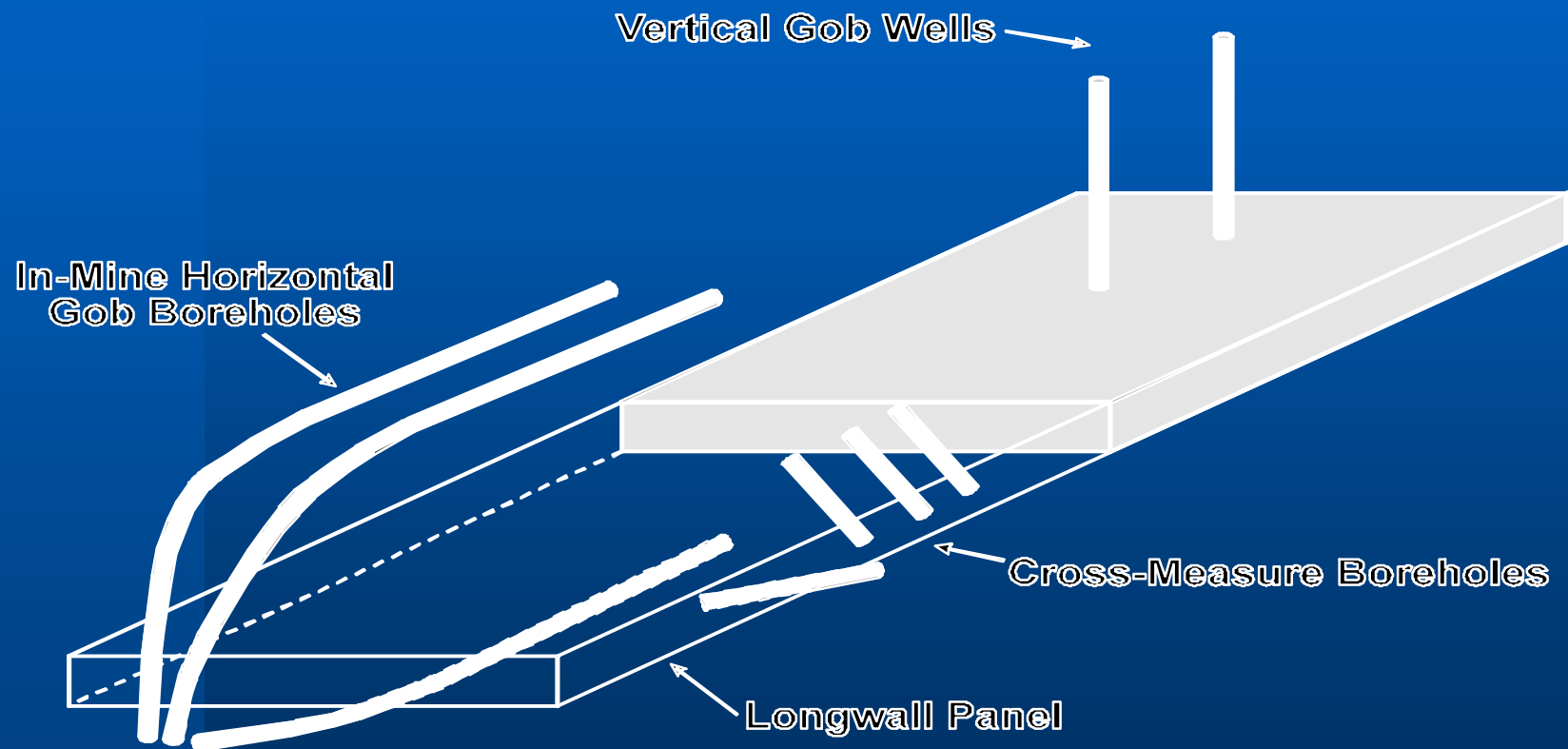
Mining Industry (1999)

- 81 mm tons
- 244 mines, 241 underground
- 296 fatalities
- Numerous outbursts & explosions

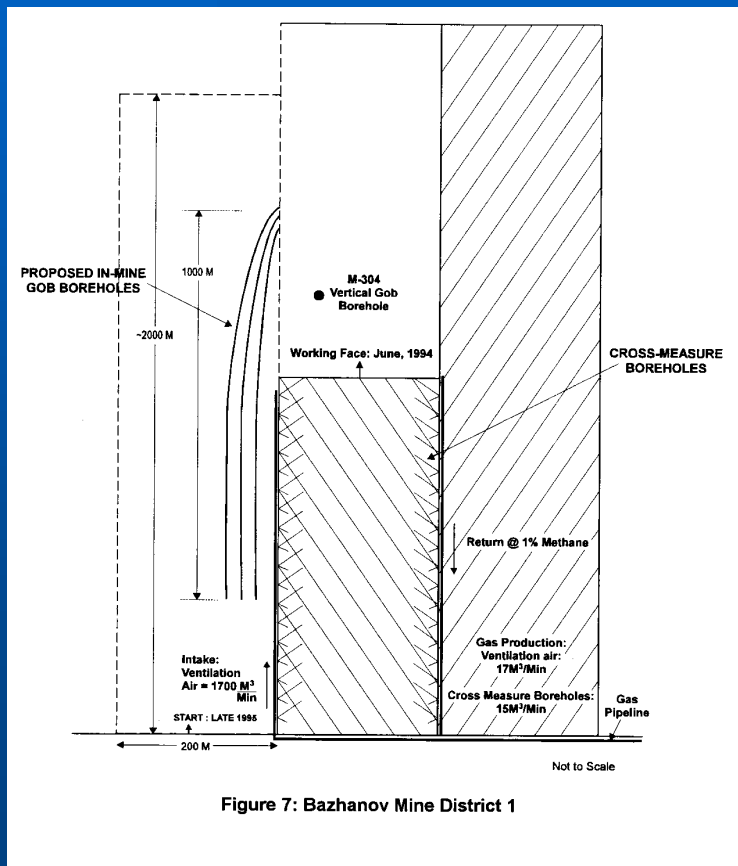


- Short cross measure boreholes
- Gas quality 30-50% methane
- Gas drainage efficiency $< 20\%$

Typical Gob Gas Drainage Techniques



Proposed Methane Drainage Approach



- Long in-mine gob boreholes
- Improve gas quality
- Improve gas drainage efficiency

CMM Development



With all this potential, why haven't any projects been started?

Barriers to Development

- **Political**

- Unstable, reorganization
- National, regional, and municipal agencies
- Corruption
- Different perception of risk
- Contrasting motivations and incentives

Barriers to Development

- Legal

- No firm mechanism to solve problems
- CBM and CMM ownership
- Exploration vs. Production License
- Non-transferable
- Land Code

Barriers to Development

- **Tax Issues**

- Vague
- Double taxation
- Accounting (depreciation) issues
- Taxation on possible sales estimate before revenues are generated
- Inconsistent rate of taxes and fees (e.g. VAT, rent and geological fund tax, etc.)
- Artificially limits Return on Investment (ROI)

Barriers to Development

- **Other**

- **Fixed gas pricing**
- **Funding**
- **Importation of equipment**
- **Equipment certification**
- **Various agency approvals**
- **Repatriation of capital**

Encouragement

- **Advisory Board (AFC)**
- **Production Sharing Agreement (PSA)**
- **Free Economic Zones (FEZ)**

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